

AMENDMENTS TO THE CLAIMS

A detailed listing of all claims that are, or were, in the present application, irrespective of whether the claim(s) remain(s) under examination in the application is presented below. The claims are presented in ascending order and each includes one status identifier. Those claims not cancelled or withdrawn but amended by the current amendment utilize the following notations for amendment: 1. deleted matter is shown by strikethrough for six or more characters and double brackets for five or fewer characters; and 2. added matter is shown by underlining.

1. (Currently Amended) A process for recovering a precious metal from a sulfidic material comprising the steps of:

preparing an acidic aqueous halide solution comprising a mixture of metal halides that has an oxidation potential sufficient to oxidize the sulfidic material and render the precious metal soluble in the solution;

adding the material to the acidic aqueous halide solution so that the sulfidic material is oxidized and the precious metal is solubilised; and

separating the precious metal from the oxidized sulfidic material;

wherein the metal in the mixture of metal halides is selected to function as a multi-valent species during oxidation of the sulfidic material.

2. (Previously Presented) A process for recovering a precious metal from a sulfidic material contaminated with arsenic comprising the steps of:

preparing an acidic aqueous halide solution comprising a mixture of halides that has an oxidation potential sufficient to oxidize the sulfidic material and render the precious metal soluble in the solution, and having a pH at which the arsenic is precipitated;

adding the material to the acidic aqueous halide solution so that the sulfidic material is oxidized, the precious metal is solubilised and the arsenic is precipitated; and

separating the precious metal from the oxidized sulfidic material and precipitated arsenic.

3. (Previously Presented) A process as claimed in claim 1 or 2 wherein the solution bearing the precious metal is separated from the oxidized sulfidic material and precipitated arsenic (when present) in a solid-liquid separation stage, and the precious metal is then recovered from the solution in a metal recovery stage.

4. (Original) A process as claimed in claim 3 wherein in the metal recovery stage the precious metal is adsorbed onto activated carbon in one or more carbon-containing columns.
5. (Original) A process as claimed in claim 4 wherein after precious metal adsorption onto activated carbon the carbon is eluted with a cyanide solution and the eluate is passed to an electrolysis stage for the recovery of the precious metal.
6. (Previously Presented) A process as claimed in claim 3 wherein the metal recovery stage is provided in-line, after the solid-liquid separation stage, and prior to solution recycle to sulfidic material oxidation.
7. (Previously Presented) A process as claimed in claim 1 wherein the precious metal to be recovered is gold, silver, platinum or another platinum group metal.
8. (Previously Presented) A process as claimed in claim 1 wherein the metal halide solution has a halide concentration of approximately 8 moles per liter.
9. (Original) A process as claimed in claim 8 wherein the halide is chloride or a mixture of halides comprising chloride and bromide.
10. (Previously Presented) A process as claimed in claim 8 or 9 wherein the metal in the dissolved metal halide solution is copper and/or iron.
11. (Previously Presented) A process as claimed in claim 1 wherein the sulfidic material oxidation step comprises one or more leaching stages such that:

(i) for an un-contaminated single-refractory pyritic material the sulfidic material oxidation step comprises a single leaching stage in which the pyritic material is oxidized and the precious metal simultaneously solubilised; or

(ii) for a contaminated single or double refractory pyritic material, the sulfidic material oxidation step comprises a two stage leaching process wherein the solution from the first leaching stage is fed to the second leaching stage.

12. (Previously Presented) A process as claimed in claim 11 wherein for (ii) the pyritic material is an arsenopyrite, and in a first of the leaching stages the oxidation potential is controlled to leach arsenic into solution and the solution pH is controlled such that, once leached, the arsenic precipitates as ferric arsenate, and in a second of the leaching stages the pyrite component is leached and the solution pH is controlled to maintain arsenic as a ferric arsenate precipitate so that the arsenic passes out of the process with the oxidized sulfidic material.

13. (Previously Presented) A process as claimed in claim 12 wherein in the first leaching stage the material is contacted with solution at an Eh of around 0.7-0.8 volts sufficient to leach the contaminant and solubilise the precious metal, at a solution pH that is less than 1 but greater than about 0.5 so as to precipitate the arsenic immediately after it is leached, and at a solution temperature of about 80-105.degree. C.

14. (Original) A process as claimed in claim 12 or 13 wherein in the second leaching stage the material is contacted with a solution having an Eh of around 0.8-0.9 volts sufficient to leach pyrite, the solution pH is less than 1 but greater than about 0.2 so as to precipitate the arsenic immediately after it is leached, and at a solution temperature about 90.degree. C. to 105.degree. C.

15. (Previously Presented) A process as claimed in claim 1 wherein after precious metal recovery a solution conditioning stage is employed to precipitate ferric sulfate and thus control the level of this species in the process.

16. (Original) A process as claimed in claim 15 wherein in the solution conditioning stage limestone and calcium carbonate are added to the solution to form a hematite/gypsum precipitate which is then filtered and disposed of with the solids residue from the leaching stage(s).

17. (Previously Presented) A process as claimed in claim 1 wherein, when a high level of carbon is present in the sulfidic material, a surfactant is added to the solution during the sulfidic material oxidation step to prevent precious metal from adsorbing onto carbon in the material, or activated carbon is added to the solution during the sulfidic material oxidation step to preferentially adsorb precious metal onto the activated carbon.

18. (Original) A process as claimed in claim 17 wherein the surfactant is one or more organic solvents including kerosene or a phenol ether.

19.-39. (Cancelled)